MWI 7120.4 REVISION D

EFFECTIVE DATE: July 25, 2005 EXPIRATION DATE: July 25, 2010

MARSHALL WORK INSTRUCTION

ED01

DOCUMENTATION PREPARATION, PROGRAMS/PROJECTS

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VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		5/14/99	
Revision	A	7/10/00	General Revision. This revision supersedes document preparation, formatting, and numbering requirements, except drawings and parts lists, in MSFC-STD-555.
Revision	В	6/14/02	Clarify general and specific instructions to eliminate unnecessary details, eliminate inappropriate specific requirements of referenced military standards, and update footer.
Revision	С	10/28/2004	Updated URL. Changed approval signature. This revision addresses implementation of MPR 1600.1 ACI requirements and addition of software documentation requirements (software specification and version description document). Revised document throughout so that all requirements state "shall" to satisfy CAITS action #04-DA01-0387 and to update font of document to Times New Roman.
Revision	D	7/25/2005	Revised to change NPR 1620.1, Security Procedural Requirements to NPR 1600.1 NASA Security Program Procedural Requirements throughout document; add 7120.5 NASA Program and Project Management Processes and Requirements to applicable doc list; update font to Times New Roman.

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1. PURPOSE

The purpose of this document is to provide preparation instructions for all in-house Program/Project documentation and Multiprogram/Project common-use documentation in accordance with MPR 7120.3, Data Management, Programs/Projects.

2. APPLICABILITY

This instruction applies to programs and projects defined in MPR 7120.1, Program/Project Planning. Existing approved documents are not required to be reformatted to meet the latest revision of this instruction. External documents are prepared as specified by the originating entity or as specified in the contract. Departures from the documentation preparation and revision requirements specified herein are allowable to meet a unique Program/Project special need, unless such departures conflict with other NASA or Marshall Space Flight Center (MSFC) requirements specified in Sections 6.1 and 6.2. For example, the Program/Project shall document the rationale and methodology for such departures in the Program Plan, Project Plan, or Data Management Plan. The numbering system for drawings and parts lists in MSFC–STD–555 shall be used for flight products; however, it may be used for nonflight products. If this numbering system is not used for nonflight products, the substitute system shall be documented.

3. APPLICABLE DOCUMENTS

- 3.1 17 U.S.C. 401 or 402
- 3.2 FAR Clause 52.227-14, Alternate II, "Rights in Data—General"
- 3.3 FAR Clause 52.227–20, "Rights in Data—SBIR Program"
- 3.4 NPR 1441.1, "NASA Records Retention Schedules"
- 3.5 NPR 1600.1, "NASA Security Program Procedural Requirements"
- 3.6 NPR 2200.2, "Requirements for Documentation, Approval, and Dissemination of NASA Scientific and Technical Information"
- 3.7 NPR 7120.5, NASA Program and Project Management Processes and Requirements
- 3.8 MPD 2190.1, "MSFC Export Control Program"
- 3.9 MPR 1440.2, "MSFC Records Management Program"
- 3.10 MPR 1600.1, "MSFC Security Procedural Requirements"
- 3.11 MPR 2220.1, "Scientific and Technical Publications"

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- 3.12 MPR 7120.1, "Program/Project Planning"
- 3.13 MPR 7120.2, "Multiprogram/Project Common-Use Documentation"
- 3.14 MPR 7120.3, "Data Management, Programs/Projects"
- 3.15 MPR 8040.1, "Configuration Management, MSFC Programs/Projects"
- 3.16 MWI 7120.1, "Project Quality Plan"
- 3.17 MSFC-STD-555, "MSFC Engineering Documentation Standard"
- 3.18 MIL-STD-961, "Defense Specifications"
- 3.19 MIL-STD-962, "Defense Standards and Handbooks"
- 3.20 IEEE/EIA 12207.1, "Industry Implementation of International Standard ISO/IEC 12207:1995, Software life cycle processes—Life cycle data"

4. REFERENCES

None.

5. **DEFINITIONS**

The definitions in MPR 7120.3, MPR 7120.2, MPR 1600.1, NPR 1600.1 and MPR 8040.1 apply.

- 5.1 <u>Administratively Controlled Information (ACI)</u>. Official information and material of a sensitive but unclassified nature, which does not contain national security information (and therefore cannot be classified), nonetheless, should still be protected against inappropriate disclosure.
- 5.2 <u>Gender-Neutral Language</u>. Terminology that eliminates sex discrimination in the language of regulations, guidelines, and policies.
- 5.3 <u>Handbook (HDBK)</u>. A guidance document that enhances user awareness by providing engineering information; lessons learned; possible options to address technical issues; classification of similar items, materials, or processes; interpretative direction and techniques; and any other type of guidance information that may help the Government or its contractors in the design, construction, selection, management, support, or operation of systems, products, processes, or services.

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- 5.4 <u>Interface Control Drawing/Document (ICD)</u>. A drawing or document that depicts detailed quantitative physical and functional interfacing data of an item. These drawings or documents are used as design control documents, delineating interface engineering data coordinated for the purposes of:
- 5.4.1 Establishing and maintaining compatibility between interfacing items.
- 5.4.2 Controlling interface designs, thereby preventing changes to item requirements that would affect compatibility with interfacing subsystems.
- 5.4.3 Communicating design decisions and changes to participating activities.
- 5.5 Manual (MNL). A reference book or guidebook providing instructions.
- 5.6 <u>Plan (PLAN)</u>. A detailed scheme, program, criteria, or method worked out prior to the accomplishment of a process, test, practice, etc.
- 5.7 <u>Procedure (PROC)</u>. A set of established methods for performing or effecting a process, test, etc.
- 5.8 Report (RPT). An account or summation of the results of an activity, test, research, etc.
- 5.9 <u>Requirements (RQMT) Document</u>. Documentation defining essential needs or preferences for the development of an item, system, etc. (e.g., A requirements document justifies the need to develop an electronic system or a product to support an experiment.) NOTE: A requirements document is not the same as a specification or ICD.
- 5.10 <u>Specification (SPEC)</u>. A document that clearly and accurately describes essential technical and interface requirements for products and also the verification requirements for determining whether those specification requirements are met.
- 5.11 <u>Standard (STD)</u>. A document that establishes uniform engineering or technical criteria, methods, processes, and practices.
- 5.12 <u>Version Description Document (VDD)</u>. A document unique to software that accompanies and identifies a given version of a system component. Typical content includes an inventory of system or component parts, identification of changes incorporated into the version, and installation and operating information unique to the version described.

6. INSTRUCTIONS

6.1 <u>Program/Project Documentation—General Preparation</u>. Program/Project documentation shall be prepared in accordance with the format requirements of this document and the content requirements specified by the Program/Project, unless other Center procedures apply (e.g.,

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specific Marshall work instructions that address the technical content of a Program/Project Plan (see MPR 7120.1), Quality Plan (see MWI 7120.1), Configuration Management Plan (see MPR 8040.1), Data Management Plan (see MPR 7120.3), Scientific and Technical Publications (MPR 2220.1), drawings and parts lists (MSFC–STD–555), etc.). Program/ Project documentation shall include configuration documentation, Multiprogram/Project common-use documentation (see MPR 7120.2), and Program-specific/Project-specific procedures, plans, requirements, manuals, reports, and other types of documentation as specified and defined in the Program's/Project's Data Management Plan. Program-specific/Project-specific or Multiprogram/Project common-use documentation:

- 6.1.1 Shall be prepared by the Office of Primary Responsibility (OPR) designee (OPRD) using compatible Center Integrated Desktop Service (IDS) applications. The OPRD shall:
- 6.1.1.1 Ensure the use of gender-neutral language in the document.
- 6.1.1.2 Use the word "shall" to indicate mandatory requirements in the document.
- 6.1.1.3 Prepare (1) a new draft document for review, or (2) a revised draft document identifying proposed changes in the currently approved document (i.e., Use the Revision (Track Changes) tool in Word and record changes in the Document History Log.). Clearly indicate that the document is a "DRAFT" and consecutively number and date each version of the draft document. For a document controlled through the configuration control process, the draft document may incorporate multiple changes that have been authorized by the Configuration Control Board (CCB). For Configuration Management (CM) controlled documents, the change request and change directive numbers for the authorized changes being incorporated shall be recorded in the Document History Log.
- 6.1.1.4 Coordinate proposed draft document or document changes with affected parties, and Drawing/Document Checking if applicable, to the extent determined necessary prior to issuing the draft.
- 6.1.2 Shall contain, as a minimum, the following data on each page of the document (Reference Appendix Z for recommended format.):
- 6.1.2.1 Unique document number.
- 6.1.2.2 Revision level: Enter "Baseline" for initial release, the revision level for each change per paragraph 6.3.2, and "Canceled" for cancellations.
- 6.1.2.3 Document title/subject.
- 6.1.2.4 Effective date: Enter the date the approving authority approves the action. See Appendix Z for guidance on applying the effective date to a document.

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- 6.1.2.5 OPR organizational code: Specify the organization code of the office that has responsibility for the document content. Typically, the OPR organization is the preparing organization; but for Program/Project documentation controlled by the Program/Project, utilize the Program/Project organization code.
- 6.1.2.6 Document type: Each document shall be designated as a Multiprogram/Project Common-Use Document or a Program/Project Specific Document. The name of the specific Program/Project (e.g., Advanced Space Transportation Program or COBRA Main Engine Project) shall be used to designate the document as Program/Project Specific.
- 6.1.2.7 Page number and total number of pages (except the title page may be numbered or unnumbered page 1).
- 6.1.2.8 The following statement in the document footer:

CHECK THE MASTER LIST— VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE (Specific location of Master List may be entered)

- 6.1.2.9 ACI Marking at the top and bottom of each page: Information designated ACI in accordance with NPR 1600.1, NASA Security Program Procedural Requirements, and MPR 1600.1, MSFC Security Procedural Requirements, shall be conspicuously marked at the top and bottom of each page in the following manner: "Administratively Controlled Information NASA Sensitive, or Proprietary, or Investigative Records, etc." See Appendix Z for recommended placement of these markings. MPR 1600.1 states that ACI marking is not required for documents that already have cover sheets and marking for protection purposes (e.g., Federal Acquisition Regulation (FAR), For Official Use Only (FOUO), Export Control, Freedom of Information Act (FOIA)); however, they shall be protected per ACI requirements.
- 6.1.3 Shall contain notice(s) of availability limitation on the first page of the draft and approved, unclassified Program/Project documentation to prescribe the availability and distribution of Program/Project documentation as defined in Chapter 1 of this document. This notice of availability includes those distributed via electronic media (e.g., World Wide Web, CD–ROM, etc.).
- 6.1.4 Shall contain the authorization of the approving authority. Authorization shall be captured by one or both of the following methods:
- 6.1.4.1 Direct application to the finalized document. For hardcopy, this shall be a signature of the approval authority. For an electronic approval system, the approving authority authorization shall be recorded in the electronic database and the database shall maintain traceability between the document and the authorization.

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6.1.4.2 Identification of a separate authorizing document (e.g., control board directive) plus proof of document verification against that authorizing document (e.g., release "stamp"). For hardcopy, the identification of the authorizing document shall be recorded in the document, and the proof of verification shall either be recorded in the document or maintained as a separate record that shows traceability to the verified document. For an electronic approval system, the system shall maintain records showing traceability between the document and the authorizing document/proof of verification. For the authorizing document/proof of verification method to be valid, the separate authorizing document shall contain the exact disposition to be implemented (including from/to or equivalent specification of changes) and authorization of the approving authority. The verification shall ensure that the authorization was incorporated correctly into the document.

NOTE: See Appendix Z for guidance related to recording authorization in electronic document files.

6.1.5 Shall contain a Document History Log. Beginning at the baseline, provide a chronological listing of document changes to record the document's history through all revisions and, if applicable, the cancellation of the document. The Document History Log replaces the Specification Change Instruction/Document Change Instruction (SCI/DCI), MSFC Form 4140. The OPRD shall identify the following in this log:

6.1.5.1 Status.

- a. Baseline (enter at the initial release of the document).
- b. Revision (enter for each revision to the document).
- c. Canceled (enter upon cancellation of the document).
- 6.1.5.2 Document Revision. Enter the revision letter(s) that apply.
- 6.1.5.3 <u>Effective Date</u>. Enter the date the baselined or revised document is approved or the date the document is approved for cancellation.

6.1.5.4 <u>Description</u>.

- a. For baseline, indicate this is the baseline release (e.g., "Baseline Release").
- b. Enter an identifier (e.g., the section or paragraph number, the page number, etc.) and the description of the revision(s) made to the document with reasons for the revisions(s) if applicable; or
- c. Enter "General Revision" if revisions are too extensive to list.

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- d. For canceled documents, supercession information may be entered.
- 6.1.6 Shall contain, as a minimum, numbered document sections for scope or purpose, applicable documents, definitions/acronyms, specific content sections as required, and records (identify records as specified in MPR 1440.2 and NPR 1441.1). Records shall be the last numbered section after specific content sections but before appendices. The records section requirement is not applicable to standards, specifications, handbooks, ICDs, and those documents for which specific format and instructions are provided in other MSFC or applicable documents.
- 6.1.7 Templates created to assist in the preparation of documentation are optional for Program-specific/Project-specific and mandatory for Multiprogram/Project common-use documentation, and are electronically accessible from the MSFC Home Page, >Library Ref/Doc Services, >MSFC Integrated Document Library, >Multiprogram/Project and Program/Project Documents Specific Documents, Templates.
- 6.2 Additional Instructions for Specific Document Preparation

item specification.

- 6.2.1 <u>Specification Preparation</u>. A specification shall be prepared to define the requirements and the interfaces for a product. The product may be materials, parts, or software products of the configuration item to be developed. For hardware, the specification shall be prepared in accordance with the six major sections defined in MIL–STD–961, with specific paragraph titles used as a guide as appropriate. Rules regarding format and style in MIL–STD–961 shall not be used. For software and firmware, the specification shall be prepared in accordance with IEEE/EIA 12207.1. The specification shall be prepared at the program/project/configuration item levels as necessary to define the development requirements for each configuration item. The specification shall define the hardware, software, firmware, and external and internal interface requirements.
- 6.2.2 <u>Standard Preparation</u>. A standard shall be prepared in accordance with MIL–STD–962, Appendix A, and as specified in this document. Standards shall not be used to define products. Standards are usually implemented through callouts in specifications or engineering drawings.
- 6.2.3 <u>Handbook Preparation</u>. A handbook shall be prepared in accordance with MIL–STD–962, Appendix B, and as specified in this document. The handbook provides guidance and does not establish requirements or define a product.
- 6.2.4 <u>Interface Control Drawing/Document Preparation.</u> An ICD, when required, shall be so identified in the configuration item specification. If an interface control "drawing" is specified, it shall be prepared in accordance with MSFC–STD–555. If an interface control "document" is specified, it shall be prepared in accordance with MIL–STD–961. NOTE: Interface verification requirements shall be specified in Section 4 of the configuration

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- 6.2.5 <u>Drawing and Parts List Preparation.</u> Drawing and parts lists shall be prepared in accordance with MSFC–STD–555.
- 6.2.6 <u>Version Description Document Preparation</u>. The VDD shall be prepared in accordance with the content prescribed in IEEE/EIA 12207.1.
- 6.3 <u>Documentation Numbering</u>

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6.3.1 <u>Document Numbering</u>. Configuration documentation for in-house developed configuration items (CIs), excluding drawings and parts lists, and MSFC Multiprogram/Project common-use documents shall be numbered with unique "MSFC—" numbers. Program/Project documents that are released through the MSFC Release Desk shall utilize "MSFC—" numbers. Other Program/Project documents shall also use unique "MSFC—" numbers unless the Program/Project chooses to establish and document a Program/Project document numbering system in Program/Project procedures. "MSFC—" numbers shall be issued by the MSFC Release Desk and assigned as follows:

*Controlled abbreviations for document types stated above; others may be documented by the Program/Project:

BDGI	Budget
HDBK	Handbook
ICD	Interface Control Document
MNL	Manual
PLAN	Plan
PROC	Procedure
RPT	Report
RQMT	Requirements
SCHE	Schedule
SPEC	Specification
STD	Standard
VDD	Version Description Document

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For example, specifications shall be identified as follows: "MSFC–SPEC–1234;" standards shall be identified as: "MSFC–STD–2345;" handbooks shall be identified as: "MSFC–HDBK–3456." When an "MSFC–" document number is assigned, the document assigned the number shall be baselined or the number canceled; the number shall not be reassigned for another application.

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- 6.3.2 <u>Document Revision Level</u>. The controlled document revision indicator shall consist of the same document number as the one it superseded plus the word "Revision" and the uppercase revision letter beginning with the letter "A." For each succeeding revision, a revision letter shall be assigned in alphabetical sequence through the letter "Z." After Z, follow with AA, AB, AC, etc. (e.g., MSFC–SPEC–1940 Revision A).
- 6.3.3 <u>Drawing Numbering</u>. Drawing numbers shall be assigned in accordance with MSFC–STD–555.
- 6.3.4 <u>Parts List Numbering</u>. The parts list number shall be the same as the drawing number assigned in accordance with MSFC–STD–555. The parts list and the drawing can be revised independently of each other.

7. NOTES

None

8. SAFETY PRECAUTIONS AND WARNING NOTES

None

9. RECORDS

None

10. PERSONNEL TRAINING AND CERTIFICATION

None

11. FLOW DIAGRAM

None

12. CANCELLATION

MWI 7120.4C dated October 28, 2004

Original signed by Robin N. Henderson for

David A. King Director

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CHAPTER 1 NOTICES OF AVAILABILITY LIMITATIONS

CH1.1 Notices of Availability Limitations prescribe the availability and distribution of Program/Project documentation. The notices in this Chapter may apply only to NASA-produced data, or may apply to both NASA-produced and contractor-supplied data. The applicability is noted immediately after the limitation title. The limitation statements specified in CH1.8 and CH1.9 only apply to contractor-supplied data. These limitation statements are included in the document for completeness and to provide information and guidance to NASA personnel who may be receiving or handling contractor data. The scope of this document does not include contractor-supplied data and it shall not be invoked in contract requirements.

CH1.2 <u>Publicly Available Documents (NASA only)</u>. All NASA unclassified Program/Project documentation not meeting any of the criteria for distribution limitations described in NPR 2200.2, not export controlled, does not contain trade secret or confidential commercial data, and has cleared any applicable patents application process, shall be considered approved for public release and bear the following notice:

Approved for Public Release; Distribution is Unlimited.	

CH1.3 <u>Administratively Controlled Information (NASA only)</u>. ACI data is unclassified data that requires restricted user access. If NASA Program/Project documentation is designated ACI, all copies shall bear the following notice on the cover sheet. For International Traffic in Arms Regulations (ITAR), Export Administration Regulations (EAR), or Trade Secrets, the markings specified in CH1.4, CH1.5, and CH1.6 shall be inserted within the marking as specified below.

Administratively Controlled Information: [Insert the ACI designation from NASA Form 1686.*]

[If applicable, insert specific marking(s) required by MWI 7120.4 CH1.4 (ITAR), MWI 7120.4 CH1.5 (EAR), and MWI 7120.4 CH1.6 (Trade Secrets) here.]

This information may be exempted from disclosure by statute, including information exempt from disclosure by the Freedom of Information Act exemption criteria.

Degree of Protection: When not under the continuing control and supervision of a person authorized access to such material, it shall be, at a minimum, maintained under locked conditions. Handling, storage, and reproduction shall be in accordance with applicable Executive Orders, statutes, and agency implementing regulations. Keep access and reproduction to the absolute minimum required for mission accomplishment.

Violations and Sanctions: Individuals shall be subject to administrative sanctions if they disclose information designated ACI. Sanctions include, but are not limited to, a warning notice, admonition, reprimand, suspension without pay, forfeiture of pay, removal or discharge.

*ACI designations from NASA Form 1686 include: ITAR; EAR; Space Act (Sec. 303b); NASA Sensitive; Internal Personnel Rules/Practices; Investigative Records; Financial Institution Information; Geological/Geophysical Information; Personnel, Medical, and Similar Files; Business/Company Confidential; Subject to Trade Secrets Act; Patent Information;

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For additional information on the notices of availability limitation statements listed below, refer to NPR 2200.2 and MPD 2190.1 or the specified FAR clauses.

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This document contains information which falls under the purview of the U.S. Munitions List (USML), as defined in the International Traffic in Arms Regulations (ITAR), 22 CFR 120-130, and is export controlled. It shall not be transferred to foreign nationals in the U.S. or abroad, without specific approval of a knowledgeable NASA export control official, and/or unless an export license/license exemption is obtained/available from the United States Department of State. Violations of these regulations are punishable by fine, imprisonment, or both.

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Limited Rights Notice (a) These data are submitted with limited rights under Government Contract No. _____ (and subcontract ______, if appropriate). These data may be reproduced and used by the Government with the express limitation that they will not, without written permission of the Contractor, be used for purposes of manufacture nor disclosed outside the Government; except that the Government may disclose these data outside the Government for the following purposes, if any; provided that the Government makes such disclosure subject to prohibition against further use and disclosure: [Agencies may list additional purposes as set forth in 27.404(d)(1) or if none, so state.] (b) This Notice shall be marked on any reproduction of these data, in whole or in part.

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APPENDIX Z—Guidance

6.1.2 Minimum Header/Footer Requirements for Each Page. The recommended format for the header and footer is shown below. It is not the required or exact format that has to be followed, but it fulfills the header and footer requirements of this document. The applicable requirements paragraph is referenced beside each data element for information. This format includes a recommended placement for the ACI marking that is required at the top and bottom of each page for data that is designated as ACI. Document templates that utilize this recommended format are available as specified in paragraph 6.1.7.

Administratively Controlled Information—TBD (6.1.2.9) Document Type (6.1.2.6) OPR Organizational Code (6.1.2.5)		
Document title/subject (6.1.2.3)	Unique Document Number (6.1.2.1)	Revision level (6.1.2.2)
	Effective Date (6.1.2.4)	Page number and the total number of pages (6.1.2.7)

CHECK THE MASTER LIST at (Specific location of Master List may be entered) VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE (6.1.2.8)

Administratively Controlled Information—TBD (6.1.2.9)

- 6.1.2.4 Effective Date and 6.1.4 Approval Authority Authority Authorization. Because the effective date has to equal the approval date, the effective date has to be added to the document after approval occurs. Therefore, this requirement drives the control process to either:
- (1) Include at least one follow-on step after approval in which someone is designated to add the effective date to the document (coversheet, header, document history log). This fact makes it very difficult to utilize the hardcopy signature as the approval authority authorization because the signature would be placed on a document that is not finalized.
- (2) Utilize a control board or external authorization process instead of making the document signature synonymous with approval. If there has been a previous authorization of the document such as through a control board, then the document can be finalized per the authorization, the effective date added, verification performed that the document matches the authorization, and then the document could be signed if needed.

Another follow-on action that may be desired, whether the authorization is a hardcopy signature or an electronic approval, is to record the signature back into the electronic file so that the electronic file will contain complete information or replicate the hardcopy version. This can be done by having a "Signed By" block and filling in the name/date, or by recording the name with a "/s/ name" format, or by scanning the signature page (if hardcopy) and integrating the scanned page into the electronic file.